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Autumn Olive

FOR WILDLIFE AND OTHER
CONSERVATION USES

UNITED STATES DEPARTMENT OF AGRICULTURE

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FOR WILDLIFE AND OTHER CONSERVATION USES

By Philip F. Allan, biologist, and Wilmer W. Steiner, plant materials specialist, Soil Conservation Service

People who want to attract wildlife, conserve soil, beautify odd areas, establish plant barriers, or make ornamental plantings, find autumn olive a valuable plant.

In searching for useful plants, soil conservationists, wildlife biologists, nurserymen, and landscape specialists test many species. Once they find a particularly promising species, they try to find varieties or strains that have special values for extending and improving its usefulness.

CARDINAL AUTUMN OLIVE

At the Soil Conservation Service National Plant Materials Center, Beltsville, Md., an outstanding group of autumn olive plants (designated as BN-270) was selected as the most hardy and fruitful among those under test. Twenty-four plants of this strain yielded more than 900 pounds of berries each year. From this selection, seed was used to produce planting stock for the SCS Big Flats Plant Materials Center in southern New York and for field plant-

ing. At Big Flats, four 150-foot rows yielded 2 tons of berries annually. Extensive field plantings made in the Northeast since 1945 and in the Corn Belt States since 1954 confirmed the superiority of this strain for hardiness, yield, and growth under a wide range of soil and climatic conditions. This valuable strain (field tested under the accession numbers BN-270, NY-2409, and MICH-421) was named Cardinal in 1963. The information given in this leaflet is based primarily on tests and observations made with Cardinal autumn olive.

USES OF AUTUMN OLIVE

For Wildlife

Thickets or rows of fully grown autumn olive furnish good protective cover for many kinds of wildlife—both birds and mammals. Songbirds find the branches excellent places for their nests and game birds and rabbits find shelter under the wide-spreading branches. Raccoons, skunks, opossums, and even black bears feed on the berries. But it is as a producer of food for birds that autumn olive is most outstanding.

Birds eat the fruit (berries) of autumn olive from ripening time in September to late winter. Robins have been known to winter north of their normal range despite snows and severe cold when there were plenty of autumn olive berries. Other birds that eat the berries are cardinal, catbird, cedar waxwing, common grackle, evening grosbeak, fox sparrow, hermit thrush, house sparrow, mallard, mockingbird, myrtle warbler, purple finch, rufous-sided towhee, song sparrow, starling, tree swallow, and veery.

Bobwhite quail, ruffed grouse, mourning doves, ringnecked pheasants, and wild turkeys find autumn olive fruit highly attractive food. But it is so tasty to songbirds that they sometimes leave very little for game birds. Though many of the berries fall by early winter and are available to ground birds such as quail, some of them hang on the twigs well into winter. These are plucked by grouse, pheasants, and small birds. It takes at least 100 autumn olive plants to be certain of having enough food for both game birds and songbirds.

Most farms have odd areas such as narrow field corners, steep slopes, rocky spots, pond environs,



PA-41, 050

Berry crops of autumn olive are heavy and dependable. When ripe, the berries are red with brown scales.

and roadsides. Strips, blocks, or clumps of autumn olive can add beauty to these areas and make them useful to wildlife. Since food production is its major contribution to wildlife, wide spacing of autumn olive is needed to assure abundant annual berry crops.

Strips of several rows may be planted across sloping land. Here, the rows can be 10 to 20 feet apart with grassy strips between and the plants 6 to 8 feet apart in the rows.

In block plantings autumn olive is spaced at least 8 feet by 8 feet; in small irregular clumps they may have wider spacing.

Clumps or rows of conifers or of other fruiting shrubs along with autumn olive help make odd areas attractive to birds.

Autumn olive is planted as a border along field edges. It is particularly suitable for borders along new plantations of conifers or other trees. It also does well next to young natural stands of woodlands. When used to border old stands, it is best to plant the autumn olive at least 20 feet from the base of the trees along the edge of the woods.

Sometimes other shrubs are used with autumn olive in these borders. Then it is best to plant two rows of autumn olive next to the woods and the

other shrubs in front. In border plantings, space autumn olive plants 6 feet apart in the row and the rows about 10 feet apart.

For Screens and Barriers

As a hedgerow, autumn olive makes a screen that shuts out an unpleasant view or discourages trespassers. It will not, however, be dense enough to turn cattle or horses. For hedgerows, space plants 4 to 6 feet apart. Two such rows 10 feet apart make a good windbreak. A single row of the olive next to one of spruce, pine, or cedar makes an excellent windbreak too.

For Erosion Control

Autumn olive has some longtime values on eroding places but is, in itself, only moderately effective as an erosion-control plant. Because it is a nitrogen-fixing plant, it is usually vigorous and particularly useful on such infertile sites as strip-mine spoil banks, sand-blow areas, streambanks, and gullied areas. Autumn olive hides these eyesores quickly and in time lays down a protective litter on the soil. On bare areas the light shade, deep roots, and added



MD-30, 317

In the fall and winter autumn olive has reliably heavy crops of red berries that furnish food for many kinds of birds and beautify the landscape.



W. VA-834

Autumn olive planted for soil protection and wildlife on strip-mine spoil.

nitrogen encourage natural establishment of grass and other soil-protecting plants. Also, wildlife find food and shelter in such plantings.

For Other Uses

Autumn olive grows too large to make good ornamental plantings on the ordinary city lot except as single plants. Where space allows, however, its silvery green foliage and red berries against a background of conifers make pleasant and unusual additions to the landscape. Since these shrubs are highly favored by songbirds, landscape plantings should be located where the birds can be enjoyed.

Although nothing is known about the kind of honey produced from autumn olive flowers, honeybees are attracted to them so the plant may have value to beekeepers.

The Japanese sell the berry-laden twigs on the streets and eat the fresh berries. Autumn olive berries from most plants are, perhaps, somewhat astringent for American tastes, but they can be used for jelly.

WHAT IT IS

Autumn olive is known by several names. Its scientific name is *Elaeagnus umbellata*. It is also called autumn elaeagnus and pink-fruited elaeagn-

nus. Autumn olive was introduced in this country about 1830 from China or Japan. It is related to several other introduced plants—the Russian-olive and the summer olive—and to the native silverberry of the Western United States.

Autumn olive is a wide-spreading shrub, often growing as high as 10 to 15 feet. Its main trunk and large branches are dark brown; the smaller branches and twigs are yellowish brown and rather spiny. Leaves of autumn olive are 2 to 3 inches long and have wavy edges. They range in shape from slender to oblong and are spaced alternately on the twigs. The upper sides of the leaves are green with silvery scales, while the undersides are silvery with brown scales. The leaves drop off in the fall.

In spring, autumn olive has an abundance of sweet-scented flowers. They are yellow, small (about one-quarter inch long), and trumpet shaped. The flowers grow singly or in clusters along the twigs and small branches.

When autumn olive berries ripen, they are red with brown scales. They average about one-quarter inch long. Within the fleshy covering is a pit or seed—long, semisoft, and ribbed. The berries that do not fall to the ground in early fall turn yellowish brown and raisinlike. Berry crops of the Cardinal strain are heavy and dependable and are mostly ripe by early October. Berries of some strains ripen in September.

WHERE AND HOW IT GROWS

Autumn olive grows naturally in thickets along streams and roadsides from Afghanistan eastward through the Himalayas and northern India to Korea and Japan. In its native territory, it grows at elevations up to 9,000 feet. It is variable in hardiness, as well as in growth and fruiting habits. Some strains winterkill or are injured by moderate winter temperatures. Some seed sources produce plants that have few berries or that fail to mature fruit.

Cardinal autumn olive is adapted from Maine to Georgia and westward into Missouri. (See map, back page, for zones of proved, possible, and doubtful adaptability.) No other strains tested were adapted this far north and west. Although very hardy, some winter injury has been noted where temperatures reached -30° F. Usually the plants recover.

Autumn olive grows well on deep, sandy, loamy, and moderately fine-textured (clayey) soils that are moderately well to well drained. It does less well on very dry soil and usually fails on very shallow, poorly drained, or excessively wet soil. Autumn olive does not require highly fertile soil. It appears to thrive equally well on soils ranging from moderately acid to moderately alkaline. It is tolerant of light shade, but has fewer berries when grown in shade. Competition from grass, weeds, or other



NY-948

Autumn olive has small, yellow, sweet-scented flowers.

shrubs slows the growth of young autumn olive plants, but they overcome such competition well.

Under favorable conditions, autumn olive grows rapidly and has berries by its third to fifth year. By then, it is usually 4 to 8 feet tall.



NY-949

Double rows of autumn olive make a good windbreak.



MICH-61, 004

A single 7-year-old autumn olive growing in Michigan.

Autumn olive sometimes is heavily browsed by deer and nipped by rabbits but persists in spite of this. Severe girdling by mice sometimes kills it. Rodent damage is most likely in areas of heavy grass or weed cover.

PLANTING AND CARE

Careful planting of autumn olive pays off in successful establishment. Seedlings 1 or 2 years old are usually planted—either in the fall after leaf drop or in the spring while they are still dormant. Plantings for borders, hedgerows, windbreaks, and other strips do best if the site is plowed, harrowed, and allowed to settle before planting. Block plantings may be made in deep plow furrows or in spots from which sod has been scalped. Small clumps may also be planted in scalped areas.

The roots of the seedlings must be kept moist until planted. Make the holes for the plants deep enough to take the full root without bending. You can prune unusually long roots and tops back to 6 inches. Pack the soil firmly around the roots and stamp it down.

On poor soils a scant handful of 5-10-5 or 10-10-10 fertilizer per plant, well mixed with the soil, helps plants get off to a good start. On dry sites mulches of straw, sawdust, or wood chips are helpful. Autumn olive grows slowly in heavy sod, but cultivation around the plants for a year or two speeds their growth.

PLANTING STOCK SOURCES

Planting stock of autumn olive for an ornamental has been available commercially since 1917. In the past, it was highly variable and rarely available in

quantity. At least six commercial nurseries are producing Cardinal autumn olive in quantity. Also, several State nurseries are producing the Cardinal strain for use on State and other game lands, for strip-mine-spoil revegetation, and for highway plantings.

Until 1964 all planting stock of Cardinal autumn olive was produced from seed collected from the foundation-quality seed production blocks at SCS plant materials centers. Under SCS policy, the seed may be provided to soil conservation districts and cooperating State and other Federal agencies. Soil conservation districts grant the seed to cooperating nurserymen. Plants of the Cardinal strain have been furnished to public agencies and to district cooperators for the establishment of seed production blocks on their own land. Some of these are now producing berries.

SEED PRODUCTION

Highest seed yields of Cardinal and other improved strains of autumn olive result from plantings made especially for seed production. First, select a site in full sun on a well-drained soil. Space the plants at least 6 feet apart in the row. Space the rows 25 feet apart.

Berry production usually begins when the plants are 3 to 5 years old.

Collect autumn olive berries for seed as soon as they turn red in the fall. If you don't, birds will get them first. Lay a tarpaulin or sheet on the ground beneath the limbs to catch the berries as they are stripped off.

For clean seed for planting, storing, or shipping, remove the seed from the pulpy berries promptly. Otherwise, they ferment and the heat kills the seed.

To clean the seeds, mash the berries lightly against a screen made of $\frac{1}{8}$ -inch hardware cloth. Hardware cloth of the same mesh tacked over a small block of wood makes a good tool for mashing. Mashing too hard damages the semisoft seeds. Use a spray to wash the mashed pulp through the screen until only clean seeds remain. Then spread the wet seeds out on a clean surface and let them dry in a shady, airy place. Usually 10 pounds of fresh berries yield slightly more than 1 pound of clean seed, or about 22,000 seeds. If the seeds are to be stored any length of time, keep them dry and cool.

PLANTING-STOCK PRODUCTION

Cardinal autumn olive has a wide range in maturity, palatability, and growth habits. Its wide range in maturity dates makes food available to wildlife over long periods. Although most plants ripen their fruit in October, it is possible to select individ-

ual plants that mature fruit as early as July. Fruit flavor ranges from very astringent to very sweet. Normally a spreading shrub, individual plants range from narrow and upright to dwarf and spreading.

Autumn olive planting stock can be produced from both cuttings and seed. Since both softwood and hardwood cuttings of autumn olive root readily, it is practical to propagate individual plants selected for particular characteristics.

Either clean seed or fresh whole fruit produce good seedlings. Late October is the best time for planting, since seeds need to lie in wet cold soil over winter to germinate well in the spring. Germination of good seed ranges from 60 to 85 percent. Plant whole fruit promptly after picking or store it at low temperature until planted to prevent heating and spoilage.

Prepare raised seedbeds—3 to 4 inches high and 4 feet wide—and make access paths between the beds. Well-drained loamy soil is ideal. Mix peat moss or other organic matter thoroughly into very sandy soil.

Fumigating seedbeds greatly reduces or eliminates weed, insect, and disease problems. Methyl bromide used at the rate of 1 pound per 100 square feet for 48 hours is an excellent fumigant. Its use

requires covering the soil with a plastic cover while fumigating and observing safety precautions against the fumes. A good time to fumigate is during August or September provided the soil temperature is above 50° F. Allow the beds to air out 48 hours or more before planting.

Caution: Be sure to handle and apply methyl bromide according to directions on the container label. The gas is poisonous to humans and animals. In liquid form it can cause serious burns.

Before seeding, firm seedbeds with a roller or cultipacker. If seed is to be broadcast or drilled in 8-inch rows by a machine planter, use a roller to give a flat even surface. To get a row effect without drilling, use a cultipacker with 4-inch corrugations to firm the bed; the seed or fruit collects in the bottom of the corrugations.

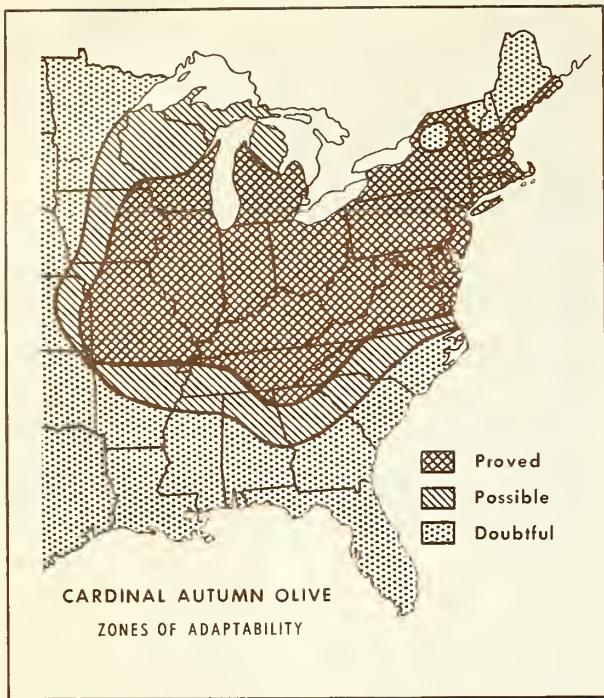
For broadcast seedings, sow evenly 6 ounces of clean seed or 4 pounds of fresh fruit for each 48 square feet of seedbed. Cover the seed or fruit with half an inch of sand either weed free or fumigated.

For row plantings, use a mechanical garden-type seeder to drill clean seeds in rows 8 to 10 inches apart the length of the beds. Set the seeder to drop the



NY-998

The wide-spreading branches of autumn olive are pleasing in the landscape.



seed $\frac{1}{2}$ -inch deep at the rate of 25 seeds per linear foot of row. No additional covering need follow mechanical drilling.

After seeding, mulch the beds with weed-free or fumigated straw. The mulch should be two or three straws deep. If deeper, remove it as seedlings begin to emerge. To hold the mulch in place against winter winds, roll out snow fence over the beds and leave until just before germination starts in the spring.

Sometimes fall seeding is impractical. If so, the seed can be treated and planted in the spring. Results usually are good but less predictable than with fall plantings.

A tendency of autumn olive to spread may keep some people from planting it. Spreading has been observed on sand blows, strip-mine spoil banks, and some State game lands. In all of these places, however, spreading is desirable. There is no evidence of its spreading on croplands or well-kept pastures. It may increase on idle land as do many other shrubs such as thornapple, blackberry, sumac, and meadow rose. Although some old naturalized thickets have been reported, no places are known where autumn olive is considered a pest.

Place clean seed in a cloth bag and soak in cool water for 24 hours. Then drain, but do not dry the seed out.

Place the moist bag of seed in a polyethylene bag and refrigerate for 30 to 45 days at a temperature of 36° to 38° F. Time the treatment so the seed is ready for planting at the start of the normal spring planting season in your locality. Planting methods are the same as for fall except that mulch and snow fence are not used.

Once the seedlings emerge, growth rate and ultimate size of the planting stock depend on good culture. You can get maximum annual growth by periodically using soluble 1-1-1 ratio fertilizer in the irrigation water until late July. Rates and frequency of application depend on soil requirements and length of season. Topdressings of fertilizer can also be used if the beds are irrigated thoroughly and immediately to prevent chemical burning. If seedbeds, sand, and mulch are not fumigated for weed control, hand or machine weeding will be necessary to keep the beds weed free. Beds planted in 8- or 10-inch rows are easier to weed with mechanical cultivators or hand-pushed wheel hoes than broadcast-seeded beds. Hand weeding is thus reduced to a minimum.

Planting stock suitable for permanent transplanting can usually be grown in one season. The shorter seasons in the north may require 2 years. One pound of seed either broadcast or drilled normally yields 3,000 to 4,000 usable year-old seedlings but may yield more if held 2 years. Plants for field planting should be at least 10 inches high and have a lower stem thickness of not less than three-sixteenths of an inch. Stock can be dug in the fall following leaf drop or in the spring while still dormant. Discard weak and spindly plants since few will survive. Bare-root seedlings survive storage, shipping, and transplanting well provided they are kept cool and moist until planted.

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